

Bridles, rein tension, and saddle pressure

*Hilary M. Clayton, BVMS, PhD, Dipl ACVSMR, MRCVS
Professor and McPhail Dressage Chair Emerita, Michigan State University
President, Sport Horse Science, 3145 Sandhill Road, Mason, MI 48854*

Equestrian sports involve a partnership between rider and horse that is based on a two-way communication in which both participants give and receive information. In the past 20 years researchers have developed an interest in studying the horse-tack-rider interaction and this talk will present some of their findings.

When a bit is used it lies within the oral cavity and crosses the bars of the jaw where there are no teeth. Trainers have a vast assortment of bits to choose from which can be bewildering. My advice is to start simple; I prefer a double-jointed snaffle with a short middle link. The double jointed bits form a U-shaped area that accommodates the tongue better than the V-shaped area under a single jointed bit. Also the double-jointed bits tend to lie further from the horse's hard palate (roof of the mouth) than the single-jointed bits, which is important because the palate is a very sensitive area and many horses object to palate pressure, for example by opening their mouth or leaning against the bit in an effort to move the mouthpiece away from the palate.

To determine the appropriate width of the bit, measure the width of the mouth at the corners of the horse's lips using a tool designed for this purpose or a piece of doweling or something similar. Add a quarter of an inch to the measured distance for a single bit or a little more when fitting a double bridle. Most horses do not have room in their mouth for a very fat bit and are more comfortable with a thinner mouthpiece. Interestingly, the size of the oral cavity is not proportional to the size of the horse: some ponies have large mouths, some draft horses have small mouths. The cheek pieces should be adjusted so the bit sits in the corner of the lips. When the bit is too low, some horses open their mouths and play with their tongue excessively.

Rein tension can be measured using strain gages inserted between the bit and the rein. In sports that do not involve taking contact with the bit, the reins jiggle in rhythm with the stride and this applies a small amount of tension (up to 2 lb) to the bit in a rhythmic fashion. In the jog this tension is applied twice per stride and in the lope it is applied once. When horses are ridden on the bit the rider maintains a constant low tension in the reins and the movements of the horse's

head and neck cause rhythmic increases in rein tension. In trot there are two tension peaks per stride during the diagonal stance phases which are usually around 5 lb and in canter there is one peak per stride of around 8-10 lb.

Bitless bridles are a popular alternative to riding with a bit. However, it should not be assumed that removing the bit removes all pressure from the horse's head. Whenever the rider takes up the reins, pressure is transmitted to some part of the horse's head. The use of pressure sensors under a bitless bridle has shown high pressure on the horse's nose and poll when the reins are used.

The pressure exerted by the saddle on the horse's back can be measured using an electronic pressure mat that transmits via Bluetooth to a computer with different amounts of pressure being color-coded in the scan that appears on the screen. Researchers have used pressure mats to evaluate saddle fit and rider technique. Ideally the rider's weight should be evenly distributed along long, wide panels with no focal concentrations of pressure. The pressure mat can detect a variety of saddle fit problems including a tree that is too wide or too narrow, stirrup bars that are too tight, a small weight-bearing area with consequently high pressures, or panels that are unevenly flocked. The following paragraphs explain some of the things that have been learned from the use of a pressure mat.

The purpose of the tree is to distribute the rider's weight over a large area of the horse's back muscles and a well-fitted saddle will accomplish this. Treeless saddles are less effective in spreading the rider's weight over a large area. Typically, there is a concentration of pressure beneath the rider's seat bones, which increases with rider weight and with the horse's speed. Therefore, treeless saddles may be less suitable for heavier riders and for those who spend considerable time riding at trot and canter. The use of an appropriate pad can help in distributing the pressure over a larger area. When riding bareback the same problem occurs but with an even smaller area of support directly beneath the seat bones.

When the saddle tree is too narrow for the horse, there are likely to be focal pressure concentrations over the horse's shoulders and the panels may show bridging, in which pressure is concentrated at the front and back of the panels with the middle part being unweighted. Sometimes, however, a saddle that appears to be bridging when the horse is standing still flattens out and has contact along the entire length of the panels due to the effect of the rider's weight at

trot and canter. A saddle with a narrow tree tends to sit high in front, which tips the rider's weight backward resulting in high pressure at the back of the saddle. If the tree is too wide, the saddle sits lower over the withers and there is a risk of the gullet making direct contact with the withers. Pressure is often increased along the inside edge of the panels when the tree is too wide.

For a saddle that fits fairly well but not perfectly a sheepskin pad may help to even out the pressure. However, a thick pad should never be used with a saddle that is too narrow over the withers. Horses find this painful and some horses may object strongly.

The development of pressure sores depends on both the amount of pressure and the time for which it is applied. Areas of focal pressure concentration may be hot, swollen or locally painful. In less severe cases there may be dry spots under the saddle surrounded by areas where the horse's back is sweating profusely; in these areas the blood capillaries have been compressed cutting off the blood supply to the sweat glands which then stop sweating.

As riders and trainers we are responsible for ensuring that our tack and equipment is comfortable for the horse. This means being vigilant in looking for signs of pressure or behaviors that indicate discomfort. Learn how to evaluate the fit of your own saddle and check it frequently, both before and after you ride. Consult an experienced saddle fitter as needed to perform a saddle-fit evaluation and to make adjustments to the flocking. Take a close look at your horse's back each time the saddle is removed, and note the presence of hair rubs, dry spots, or patches of wavy, ruffled or broken hair as early warning signs of problems.